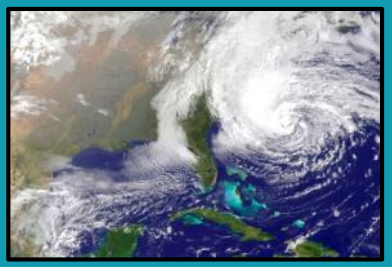
Tools for Identifying Climate Vulnerable Communities

ICARP TAC
September 15, 2017



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Tools for Identifying Climate Vulnerable Communities

- CDPH: Climate Change and Health Vulnerability Indicators for California (CHVI)

- Public Health Alliance of Southern California (PHASC): Health Disadvantage Index (HDI)

public health alliance of southern california
A Partnership for Healthy Places

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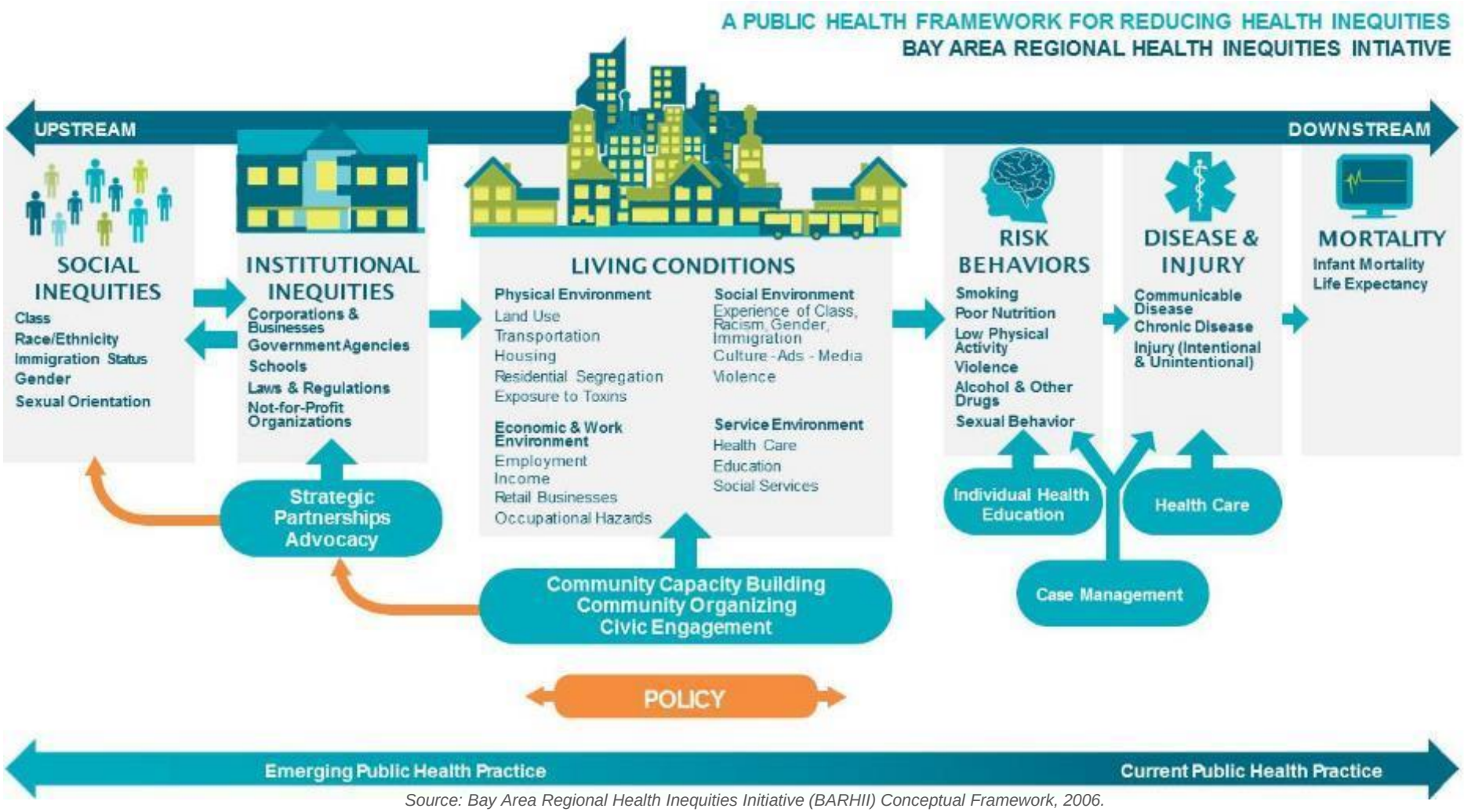
A Public Health Framework



Source: Bay Area Regional Health Inequities Initiative (BARHII) Conceptual Framework, 2006.

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Climate & Health Vulnerability

Climate Change and Health Vulnerability Indicators for California

ENVIRONMENTAL EXPOSURES

Magnitude, frequency, and duration of environmental or climate-related factors that directly affect human health

POPULATION SENSITIVITY

Physiological and socio-economic factors which directly or indirectly affect the degree to which a population is impacted by climate change

ADAPTIVE CAPACITY

Responses and adjustments to the impacts of climate change, including the capacity to moderate damages, take advantage of opportunities, and cope with consequences.

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Climate Change and Health Vulnerability Indicators for California

Environmental Exposures:

- Heat
- Air Quality
- Drought
- Wildfires
- Sea Level Rise

Adaptive Capacity:

- Air Conditioning Ownership
- Tree Canopy
- Impervious Surfaces
- Public Transit Access

Population Sensitivity:

- Children and Elderly
- Poverty
- Education
- Race and Ethnicity
- Outdoor Workers
- Vehicle Ownership
- Linguistic Isolation
- Disability
- Health Insurance
- Violent Crime Rate

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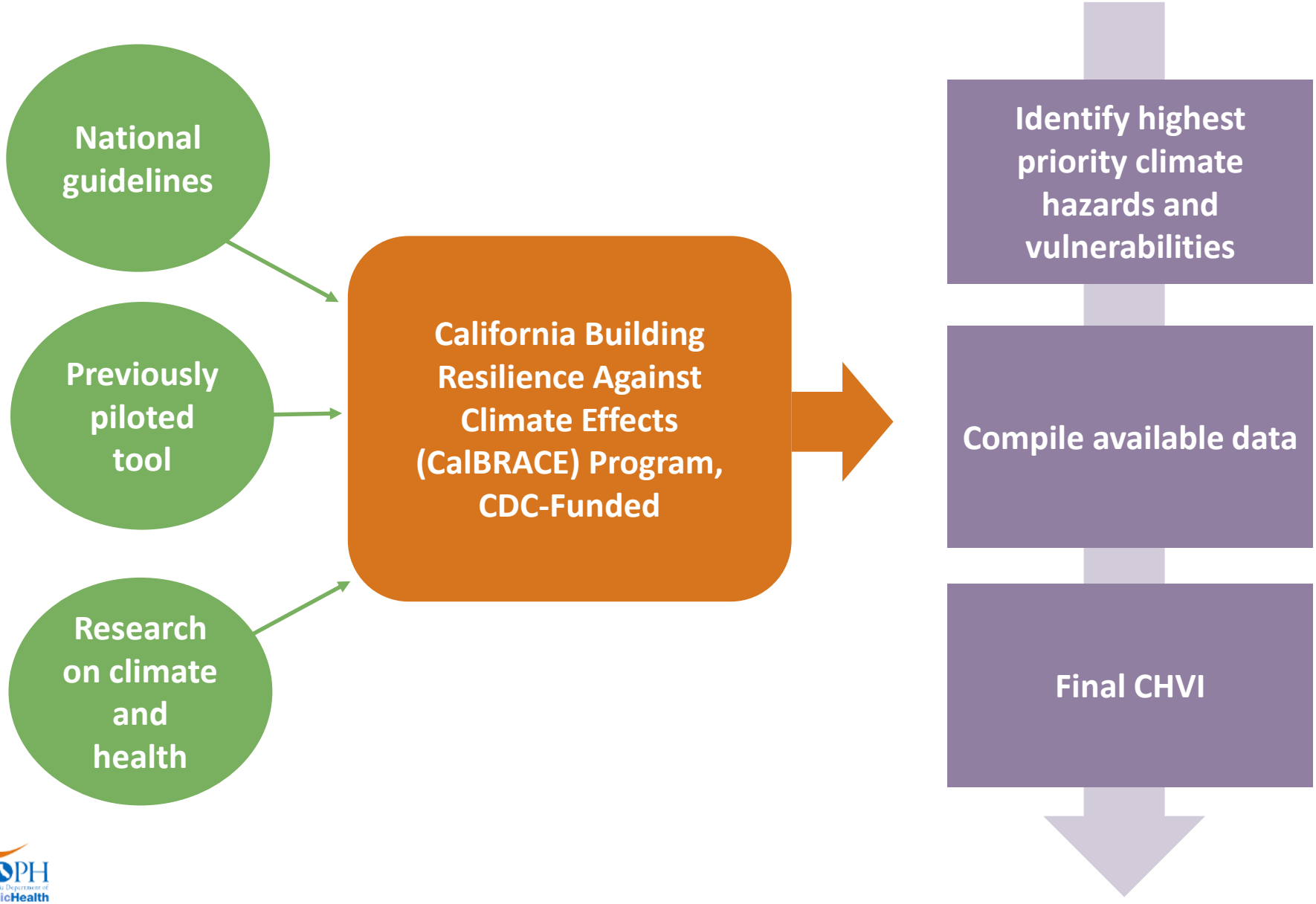
Development of the Climate Change and Health Vulnerability Indicators for California



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Climate Change and Health Vulnerability Indicators

- 3 Domains, 19 indicators
- Geographic Levels: State, Climate Region, County, Census Tract (for most indicators)
- Data can be ranked (e.g., highest to lowest, decile, ratio compared to state average)
- Some indicators can be stratified by race/ethnicity
- Public data sources
- Accompanying narratives explain data sources, how to use the data, and their relevance to climate and health

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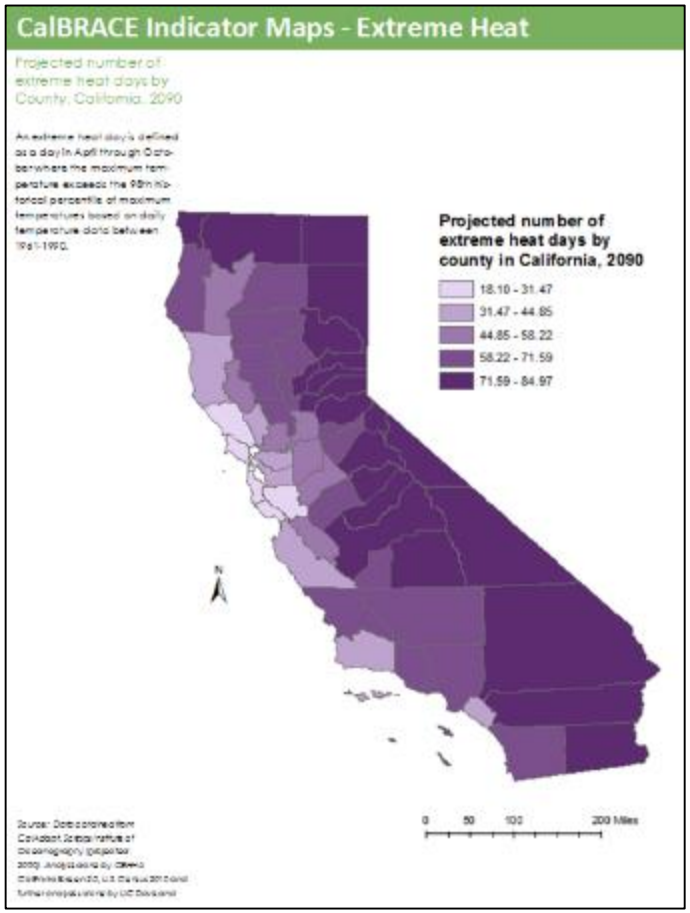
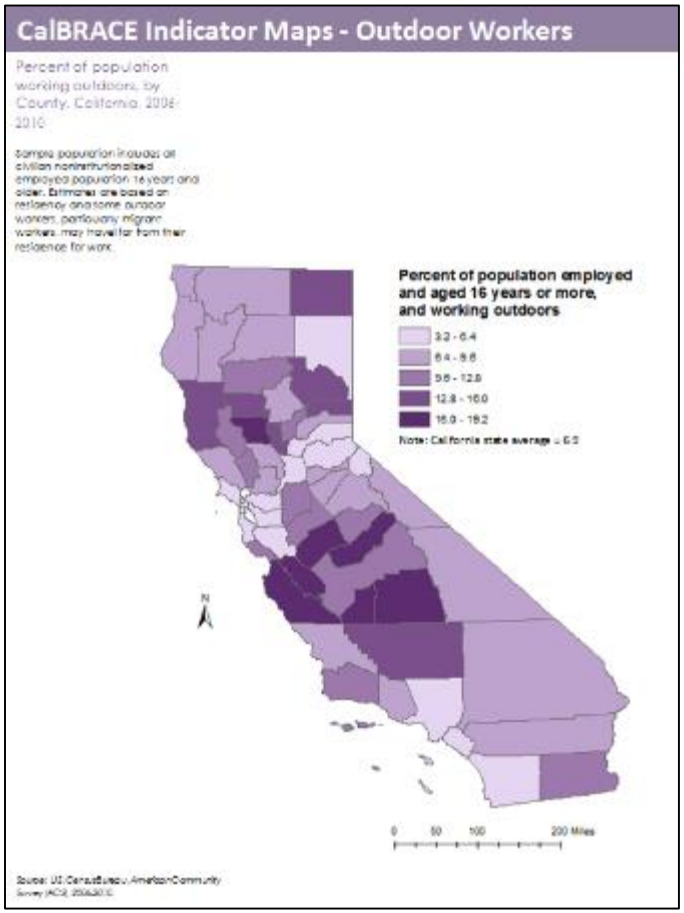
Climate Change and Health Vulnerability Indicators





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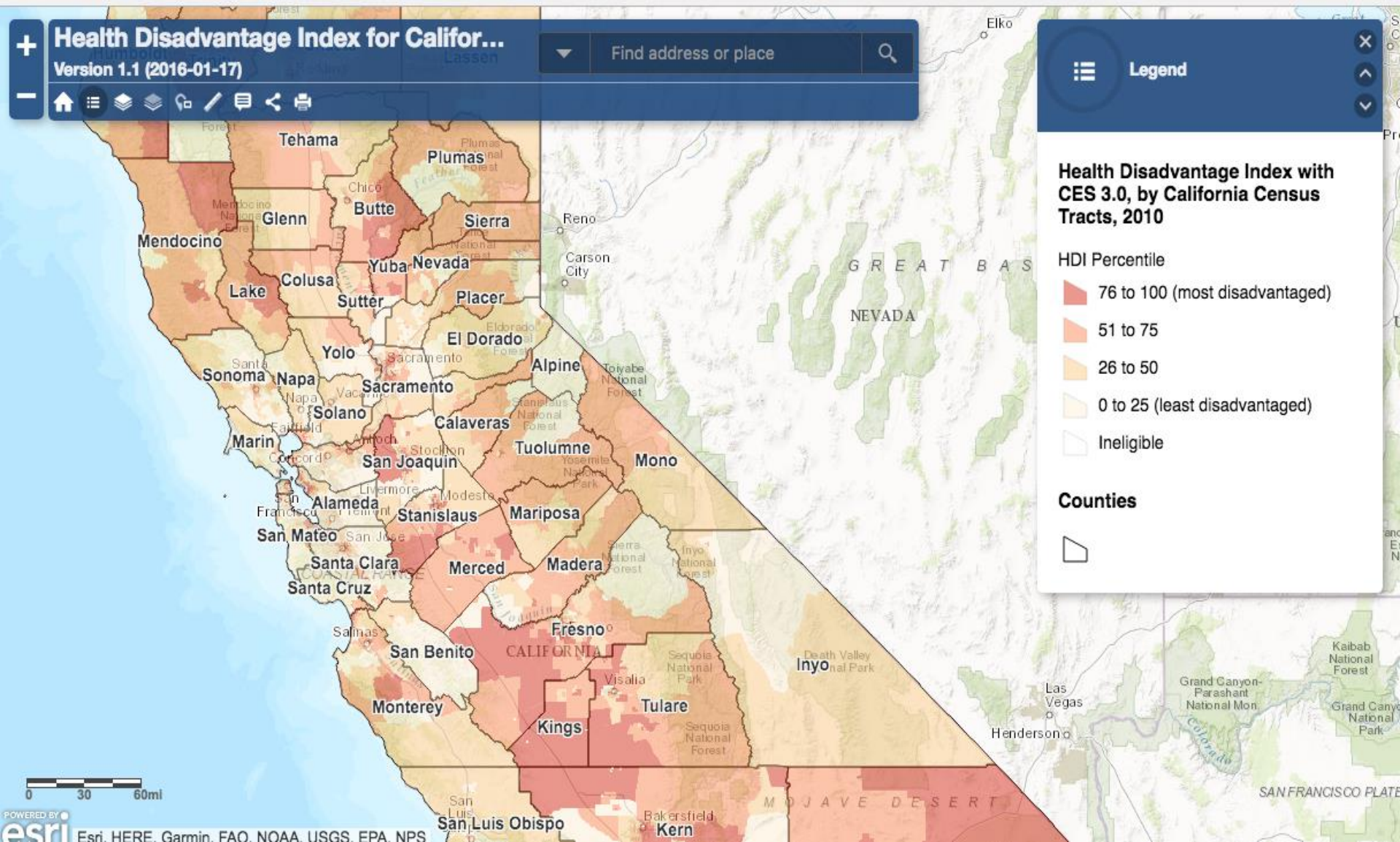
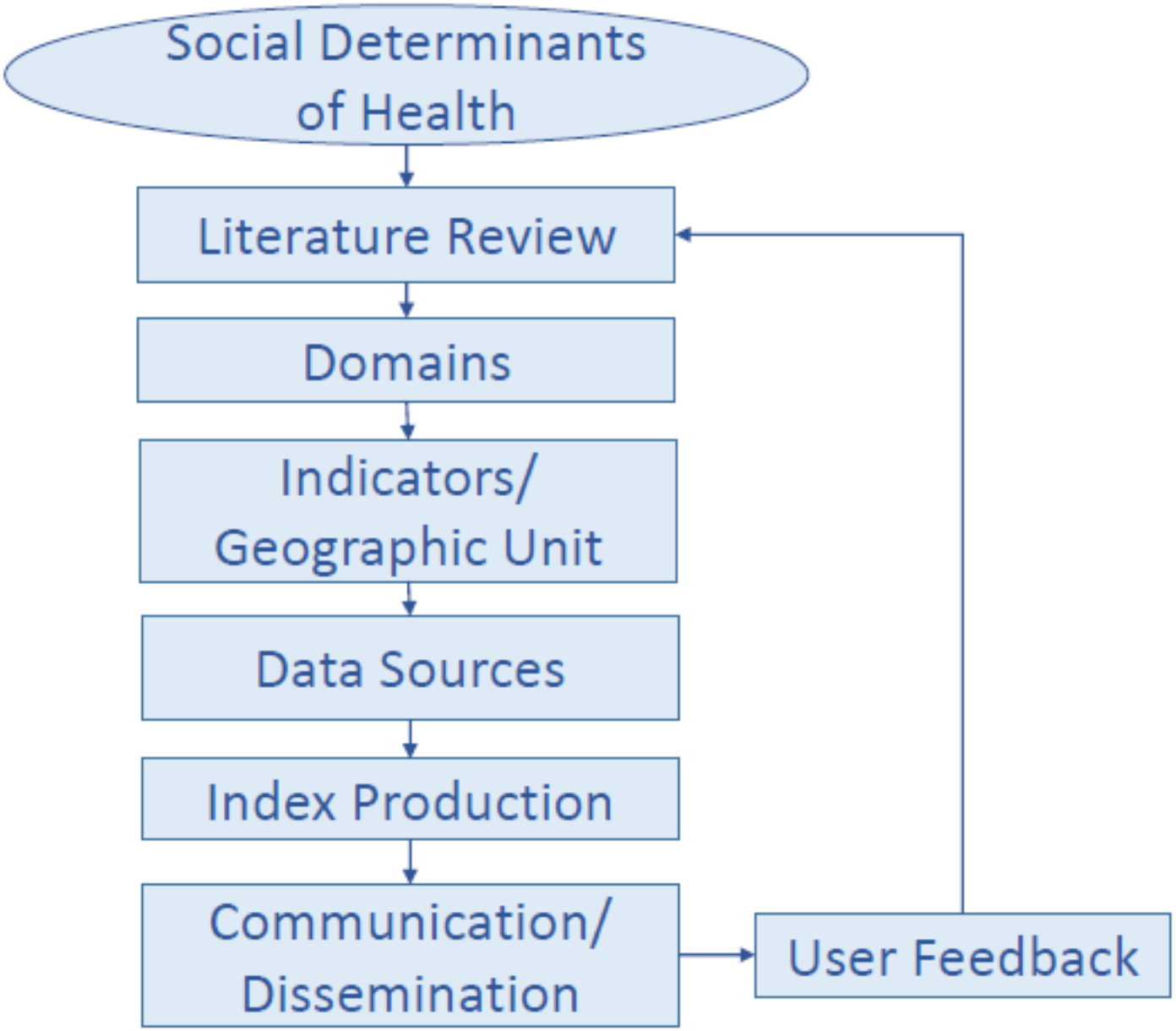
Health Disadvantage Index

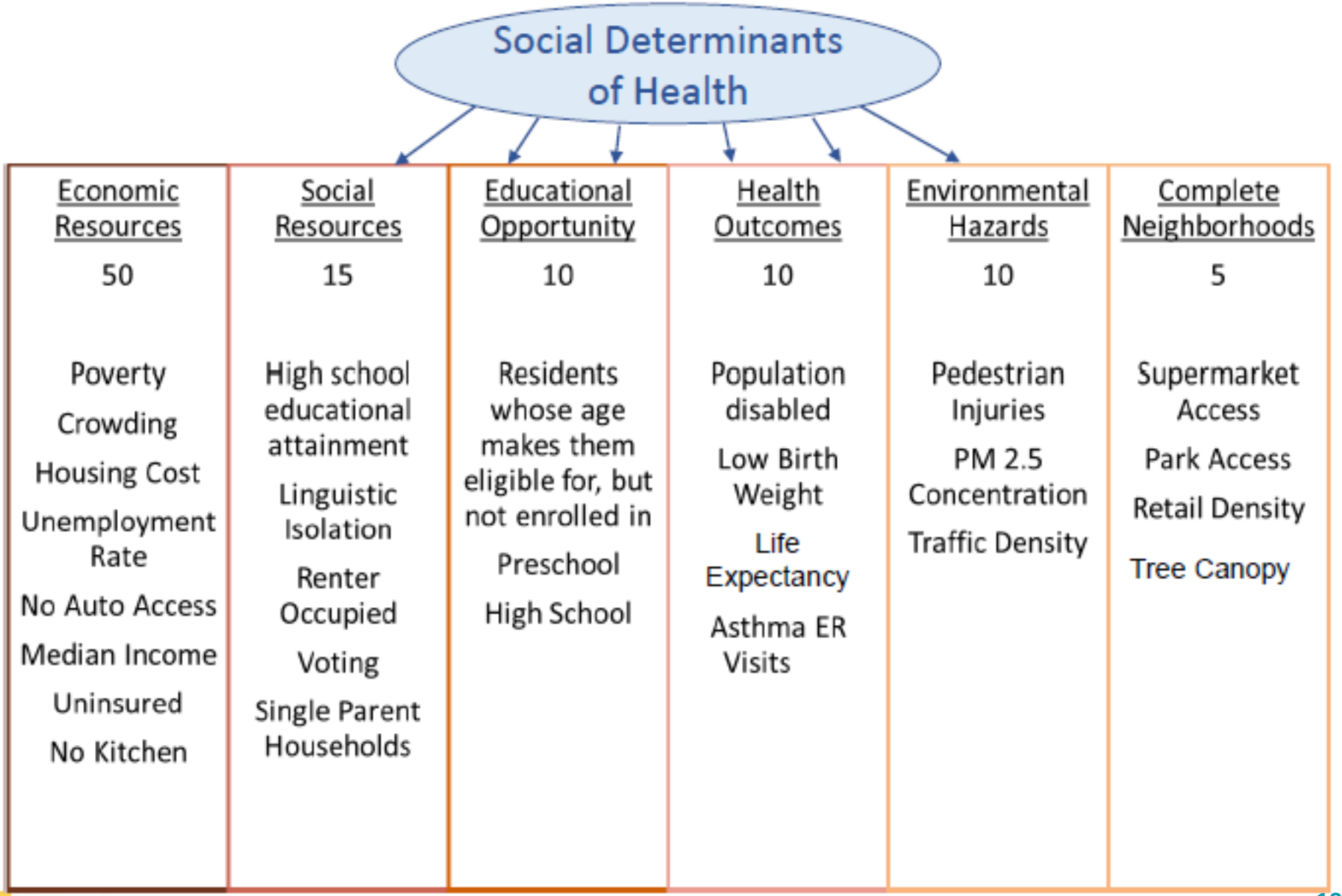
http://phasocal.org/ca-hdi/



Development of the Health Disadvantage Index



Current HDI Domains and Indicators



Current HDI Methodology

- 6 domains, 27 indicators
- Public data sources
- Geographic unit: Census Tract
- Standardize and scale each indicator: Z score between 0 (least) and 5 (most disadvantaged)
- Compute domain arithmetic means
- Total score = weighted average of domain means with weights informed by literature
- Provide raw score and percentile among 7,793 eligible Census Tracts

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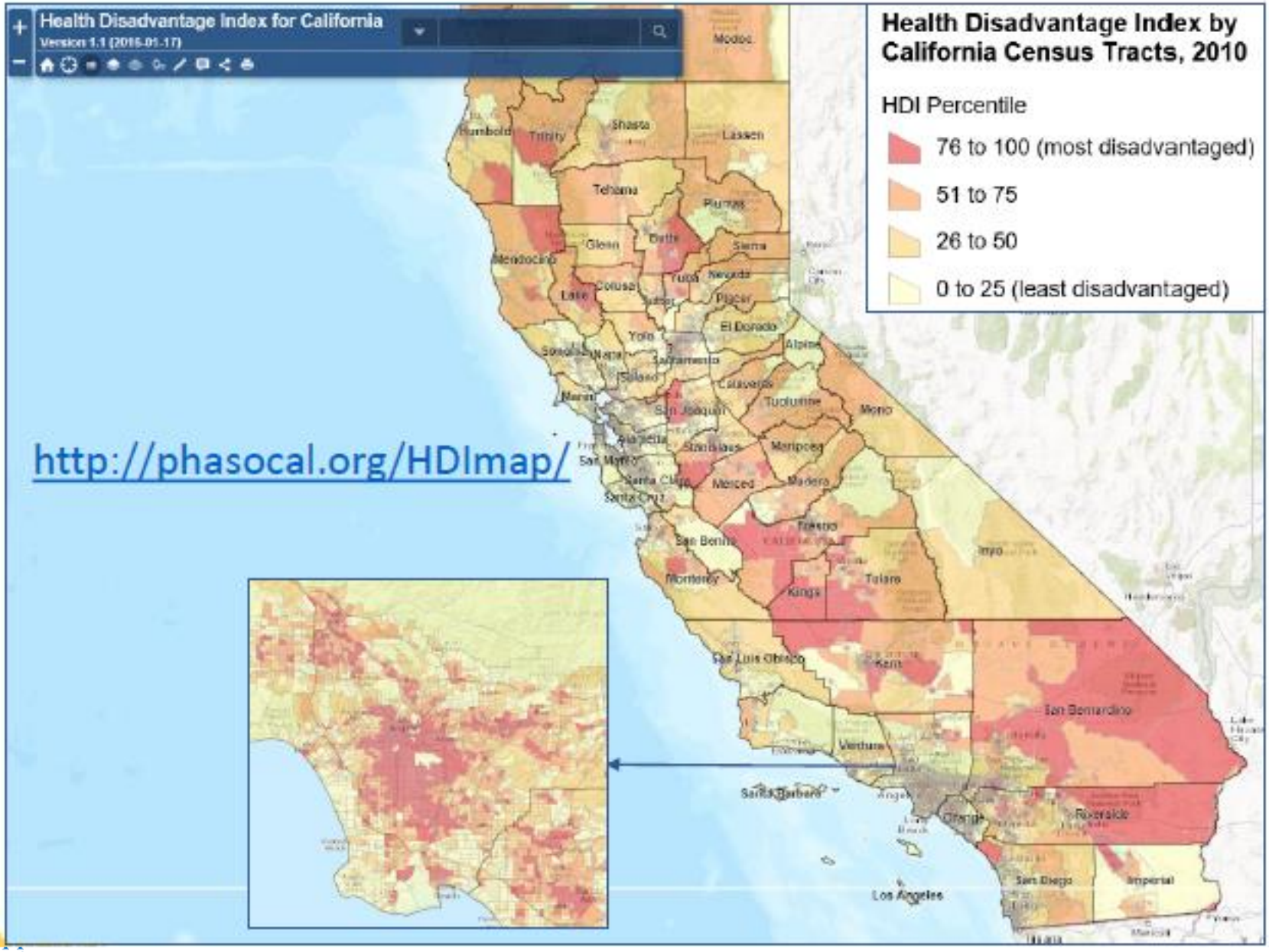
Online Map and Drill Down



Online Map and Drill Down

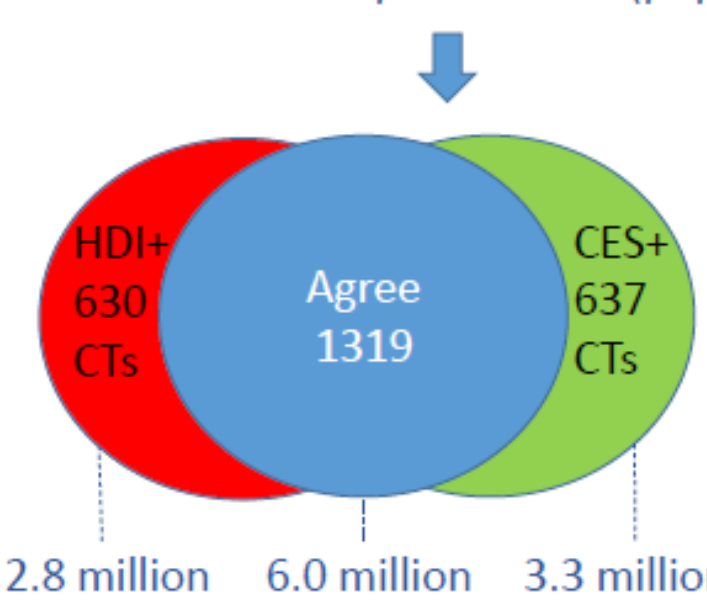
http://phasocal.org/HDImap/

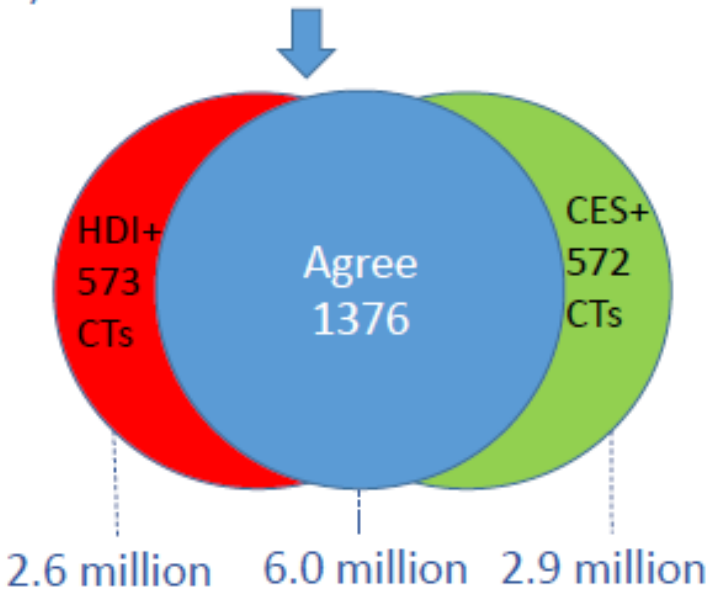
How Does HDI Compare to CES?

- HDI vs. CES most disadvantaged

HDI1.1 Top 25%	CES 2.0		CES 3.0	
	Yes	No	Yes	No
Yes	1319 (6.0)	630 (2.8)	1376 (6.0)	573 (2.6)
No	637 (3.3)	5207	572 (2.9)	5267

Millions in parentheses (population)





Life Expectancy at Birth (years) in Most and Least Disadvantaged HDI and CES Census Tracts, 2010

HDI	CES2.0	
	Top 25%	Bottom 75%
Most Disadvantaged: Top 25%	79.1	78.4
Least Disadvantaged: Bottom 75%	80.2	81.6

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Update to HDI 2.0: Healthy Places Index

- Update data with ACS 2010-2014
- Improve domain weighting and predictive power
- Validate score against health outcomes
- Improved map functionality
- Climate change indicators added as layers (decision support layers)
- Accompanying policy guides

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Thank you!

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CalBRACE program website, including links to the indicators:

https://www.cdph.ca.gov/Programs/OHE/Pages/CalBRACE.aspx

Health Disadvantage Index website:

http://phasocal.org/ca-hdi